National Institute of Environmental Health Sciences

Impact of summer droughts on the water quality of the Meuse river

Author(s): van Vliet MTH, Zwolsman JJG
Year: 2008
Journal: Journal of Hydrology. 353 (2-Jan): 17-Jan

Abstract:

Climate change will probably increase the frequency and intensity of low river flows, affecting both water quantity and water quality. Although climate change impacts on water quantity are widely recognised, the impacts on water quality are less known. The aim of this paper is to assess the effects of droughts on the water quality of the river Meuse in western Europe, based on analysis of existing water quality data. Time series of water quality were investigated at two monitoring stations during two severe drought periods, occurring in the years 1976 and 2003. Water quality during these droughts was investigated and compared to water quality during reference periods, representing common hydrological conditions and similar chemical pollution. A total amount of 24 water quality parameters were involved in the analysis, which can be divided into four groups: (1) general water quality variables (water temperature, chlorophyll-a, pH, dissolved oxygen and suspended solids), (2) nutrients, (3) major elements (e.g. chloride, fluoride) and (4) heavy metals and metalloids. To assess the effects of changes in discharge and water temperature on the concentration of chemical substances, empirical relations have been established between concentration and discharge, and between concentration and water temperature. The results indicate a general deterioration of the water quality of the Meuse river during droughts, with respect to water temperature, eutrophication, major elements, and some heavy metals and metalloids. This decline in water quality is primarily caused by favourable conditions for the development of algae blooms (high water temperatures, long residence times, high nutrient concentrations) and a reduction of the dilution capacity of point source effluents.

Source: Ask your librarian to help locate this item.

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Extreme Weather Event, Food/Water Quality, Food/Water Security, Temperature

Extreme Weather Event: Drought

Food/Water Quality: Biotoxin/Algal Bloom, Chemical

Geographic Feature:

resource focuses on specific type of geography

Freshwater

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Europe

European Region/Country: European Region

Other European Region: Meuse River

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content